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I. EVENT-RELATED POTENTIALS TO CHEMICAL STIMULI

A. Nasal Event-Related Potentials (NERPs): Smoke Studies

The first ERPs to cigarette smoke stimuli were recorded utilizing the new olfactometer/smoke delivery system.¹ The responses were simultaneously recorded from 16 electrode sites, permitting a topographical mapping of the smoke ERPs. The stimuli tested were mainstream smoke obtained from uncased DBC Bright and Burley cigarettes.

Preliminary data from three subjects revealed that for both Burley and Bright cigarettes, the largest (i.e., highest amplitude) ERPs were produced ipsilateral to the nostril being stimulated; however, it appeared that Bright ERPs were more localized and of higher amplitude than Burley ERPs. Furthermore, comparisons made between homologous electrode sites demonstrated better inter-hemispheric correlations for Bright ERPs than for Burley. Also, FFT (Fast Fourier Transform) analyses of the data revealed that for Bright ERPs, the relative power appeared to be concentrated between 1.5 and 5.0 Hz; whereas, Burley ERP FFTs appeared to contain more high frequency components. Overall, the data look very promising, suggesting that these measures can be utilized to differentiate between smoke from Bright and Burley cigarettes. If these findings can be confirmed by additional studies, the work will be extended in an attempt to use ERP measures to differentiate among other cigarette types and tobacco blends.

B. Nasal Event-Related Potentials (NERPs): Difference Testing Employing Cognitive ERPs

Numerical data comparing standard and target ERP waveforms from a single easy target experiment were submitted to John Tindall and Dick Jones of PED for further analyses. Utilizing a multidimensional scaling (MDS) paradigm, it was determined that the ERP waveforms could be described in two dimensions. Additionally, an analysis of variance comparing the ERPs along these dimensions revealed an F value that was significant at the .008 level.² In the future, it may therefore be possible to use MDS measures of ERP waveforms to aid in determining whether, and to what degree, individuals can make flavor discriminations.

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II. INSTRUMENTATION UPDATE

The smoke delivery device has been interfaced with the new olfactometer and is currently in operation. A problem with residual odors lingering in the olfactometer airstream was observed, and the necessary modifications have been designed and are presently being fabricated to correct the problem.

The computer database was reconfigured by Cadwell laboratories and now allows for the accurate storage and retrieval of 16 channels of ERP recordings. Steve Peterson of CAD is presently writing additional database routines to aid in the manipulation and quantification of ERP waveforms.

III. THE EFFECTS OF CO₂ ON CIGARETTE SMOKE FLAVOR

CO₂ discrimination training and testing continues.³ To date, three subjects have completed training and have been retested. Preliminary data from these subjects indicate that training does facilitate a subject's ability to detect CO₂. Training has been initiated in three additional subjects, and upon completion, these subjects will also be retested in order to validate these findings.

IV. REFERENCES

1. Wannamaker, I. Notebook No. 8207, pp. 55-132.
2. Tindall, J. Personal Communication. 1985 September 19.
3. Hayes, C. S. Notebook No. 8150, pp. 104-105, pp. 113-115.

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